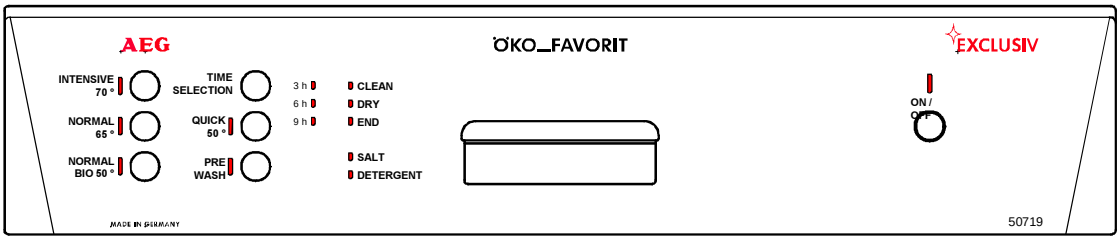
Electrolux
Technical Support Europe

SERVICE MANUAL

DISHWASHER



Dishwasher

EDW 1000
(Mini-Tronic)

© AEG Hausgeräte GmbH
Muggenhofer Straße 135
D-90429 Nürnberg
Germany

Fax +49 (0)911 323 1420

Publ.-Nr.:
599 50 84 90
685
EN

TSE - N
Edition: 10.00

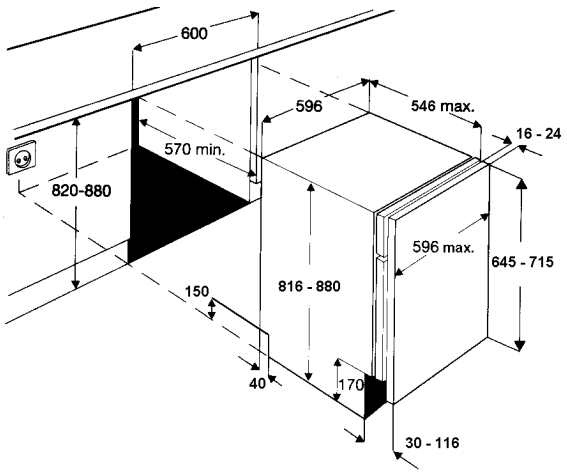
Index

1. Dimensions 3
2. Typical features for use 4
3. Components 4
   Interference Filter 4
   Pressure Switch 5
   Flow Heater 5
   Circulation Pump 5
   Drain Pump 5
   NTC Temperature Sensor 6
   Detergent / Rinse Aid Combination Dispenser Unit 6
   Electronic 6
   Water Softening 7
4. Position of Components 7
5. Water Course Scheme 10
6. All-Around Water Protection 11
   Aqua-Control Inlet Hose 11
   Safety level 11
   Leakage Protection 11
7. Water Inlet 13
8. Water load steps 14
   Static filling 14
   Dynamic filling 15
9. New pulse wash with „random“ functionality 15
   Circulation 16
   Function of the new pulse wash with “random” functionality 15
10. Sequence draining with pressure switch level check 17
   New drain with sequence draining 17
   Draining 18
11. Installation of the Drain Hose 19
12. Regeneration 19
   Rinse out after regeneration 20
   Regeneration 20
13. In- and Output elements 21
   Position of pushbuttons, LEDs and lamps 21
14. General 22
15. Input-Philosophy: Choose program- and options 23
16. Input-Philosophy: Programstart till -end 24
17. Input-Philosphy - delete, change, abort 25
18. Program phase display, Status display 26
19. Adjust water hardness: 27
20. Service-functions for assembly line 28
   Assembly line test program 28
21. Customer service functions 29
   Single actor activation 29
   Indication of customer service failure stack 29
   Delete the customer service failure stack and LED-test 30
22. Misuse and program interrupt 30
23. Overview of Service and After sales functions 31
24. Overview of failure displays 32
25. Programms and Options 33
26. Description of the options 34
27. Rinse, resin wash, regeneration and measure 35

1. Dimensions

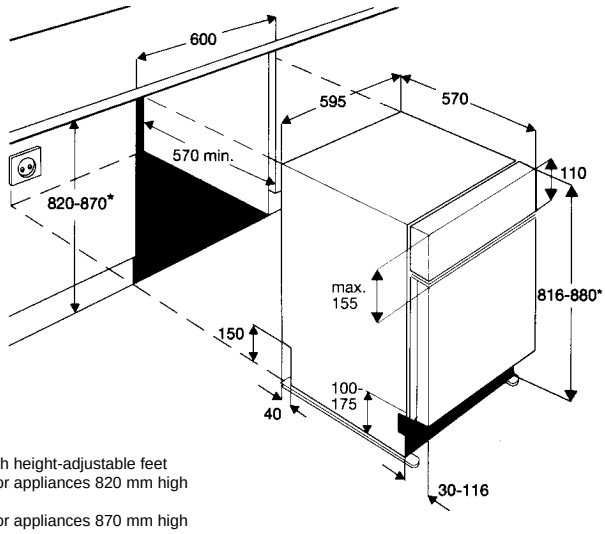
Build-in dimensions for Fully Integrated Dishwashers

ÖKO-FAVORIT



Build-in dimensions for Integrated Dishwashers

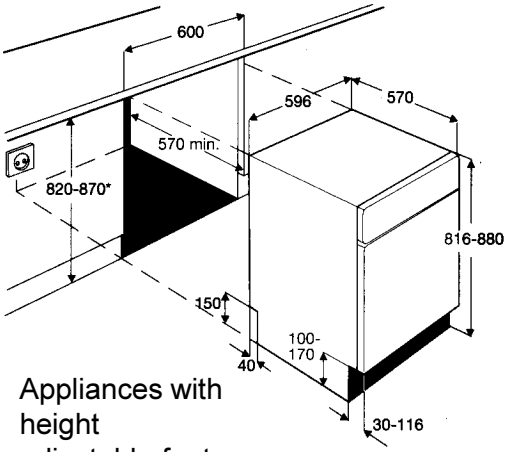
ÖKO-FAVORIT



* Appliances with height-adjustable feet
Plinth height for appliances 820 mm high
100 - 175 mm
Plinth height for appliances 870 mm high
150 - 230 mm

Build-in dimensions for Built-Under Dishwashers

ÖKO-FAVORIT



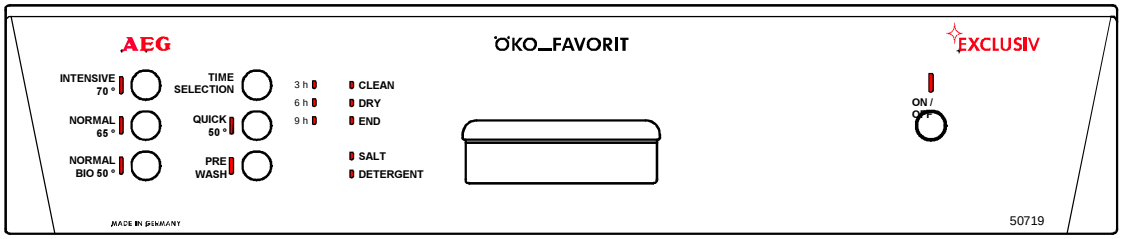
* Appliances with height adjustable feet

Dimensions for Freestanding Dishwasher

Height 85 cm
Width 60 cm
Depth 60 cm

Height with worktop removed 82 cm
Feet adjustment 1 cm

2. Typical features for use



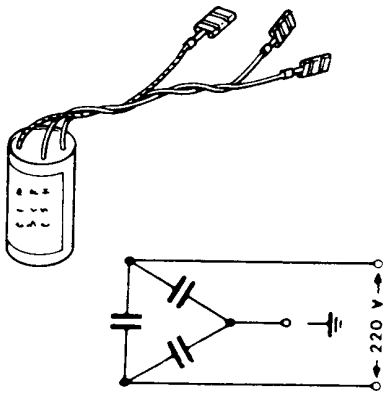
ÖKO-FAVORIT 50719 sensorlogic

Wash programs:	Intensive 70, Normal 65, Normal Bio 50, Quick 50, Prewash Extra
Power consumption:	10 A
Heating:	flow heater
Water consumption:	16 l
Energy Normal Bio 50 °C:	1.05 kWh
Energy Normal 65 °C:	1.35 kWh
Noise:	47 dB(A)

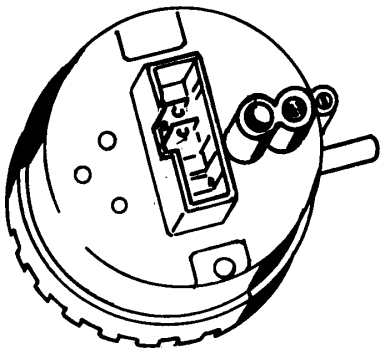
3. Components

Interference Filter

The interference filter is connected in the terminal board parallel to the mains feed.



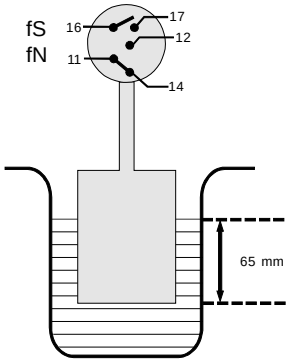
Pressure Switch

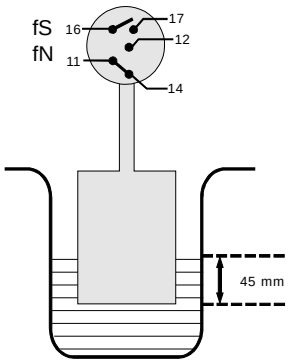


The pressure switch controls the water level.
Without water, contact 11 - 12 is closed.

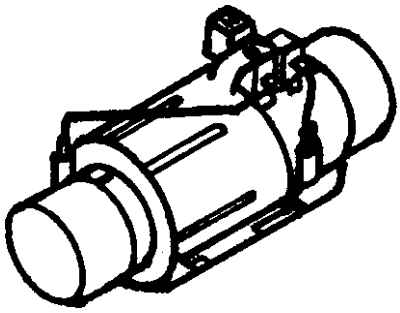
fN	Switch point with level	65 mm Ws
	Reset point with level	45 mm Ws
fS	Switch point with safety level	114 mm Ws
	Reset point	90 mm Ws

The pressure switch is not adjustable.





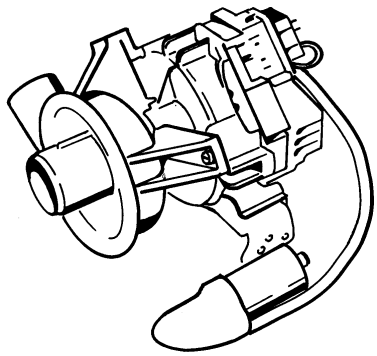
Flow Heater



The flow heater heats the water to the required temperature. During the wash cycle, water is contantly passing through the flow heater.

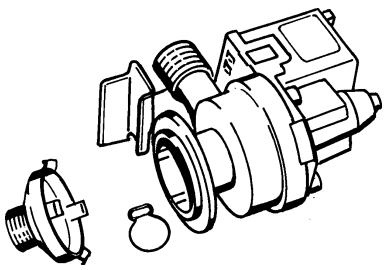
Power output	2100 W
Resistor	25 Ω
Protector	98 °C ± 5 K
Thermal fuse	260 °C

Circulation Pump



The circulation pump is driven by an asynchronous motor with an auxiliary winding. The auxiliary winding ist in circuit with a 4 mF capacitor. A tacho generator is used for speed control.
There are three speeds for rinsing.
2800 1/min, 2200 1/min, 1900 1/min, 1700 1/min, 1600 1/min, Power output 50 W.

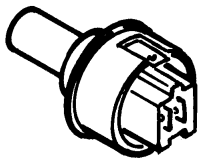
Drain Pump



The drain pump is driven by a synchronous motor.
Power output 26 W.
Pump rate 15 l/min.

NTC Temperature Sensor

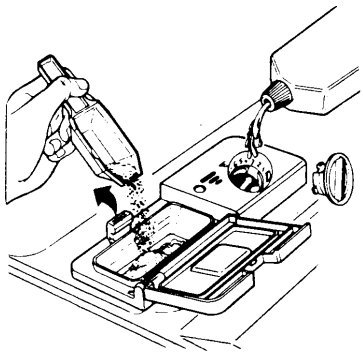
NTC-Temperaturfühler **Temperature sensor NTC-resistor**	
Temperatur/Widerstand	20 °C / 6032 Ω
temperature/resistor	25 °C / 4829 Ω
(nur bei vollelektron.	30 °C / 3891 Ω
Geschirrspüler)	40 °C / 2573 Ω
(only for fully electronic dishwasher)	50 °C / 1741 Ω
	55 °C / 1444 Ω
	60 °C / 1204 Ω
	65 °C / 1009 Ω
	70 °C / 849 Ω

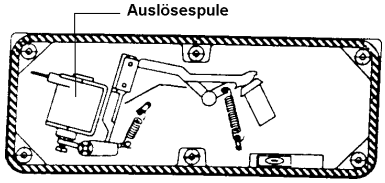


Detergent / Rinse Aid Combination Dispenser Unit

Detergent dosage = 20 ml - 30 ml

Rinse Aid capacity 150 ml
Dosage settings 1 - 6
Quantity 1 cm^3 - 6 cm^3



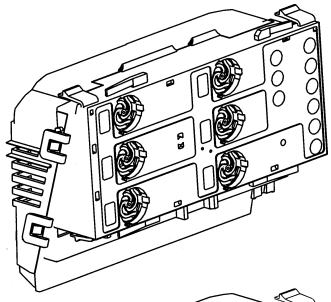


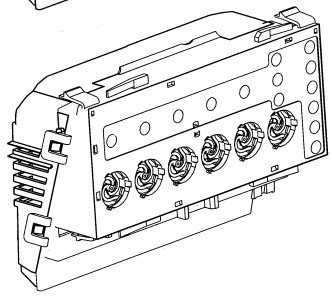
The detergent dispenser is activated by a release coil. The first operation adds the detergent, and the second the rinse aid. If the door is opened, the latching bar is reset to the detergent dosage position.

Electronic

On electronic models, a micro processor controls all components, this is done using triacs. The electronic also memorizes all programme data.

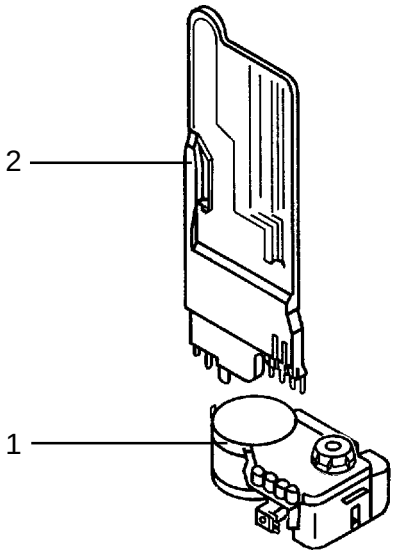
The heating is switched by a relay on the electronic board.





Water Softening

The components required for water softening.
1. softener unit
2. regeneration dosage chamber



The incoming water flows through the softener which works according to the ion exchange principle. The ion exchanger is filled with small epoxy resin balls. The resins exchange the hardness constituents (calcium and magnesium), for sodium ions.

When all the sodium ions are used up, it is necessary to regenerate the softener. This is done by flushing a brine solution through the softener.

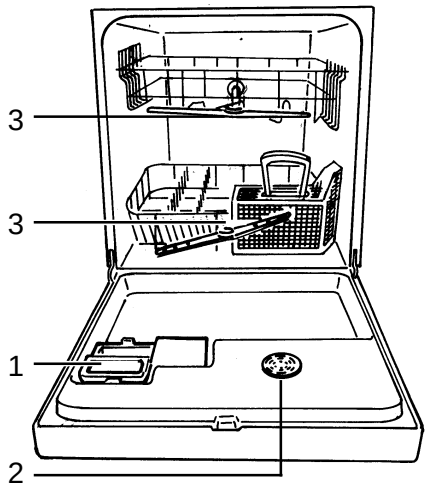
Afterwards the softener is washed out with fresh water and is now fully effective.

Depending on the water hardness, regeneration is only necessary after several wash cycles.

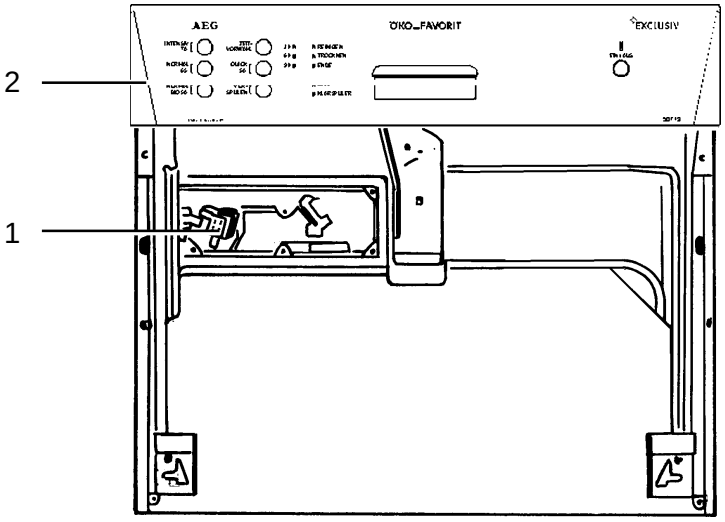
The softening system is designed for a water hardness of up to 50 °dH.

4. Position of Components

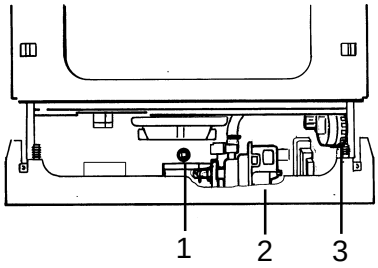
Detergent dispenser (1)
Drying fan intake vent (2)
Spray arms (3)



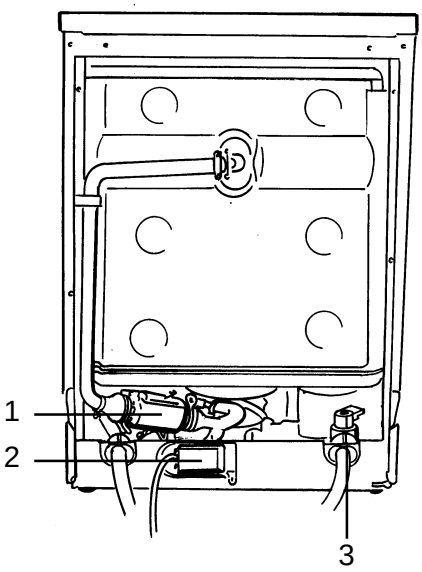
Detergent dispenser (1)
Electronic (2)



Thermal sensor (1)
Drain pump (2)
Pressure switch (3)



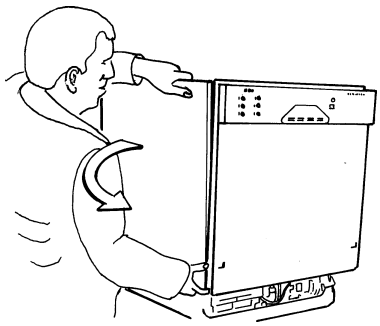
Flow heater (1)
Terminal board (2)
Inlet valve (3)



To remove side panel :

1 Remove fixing screws

2 Pull the panel away from the rear, and gently out of the front trim.

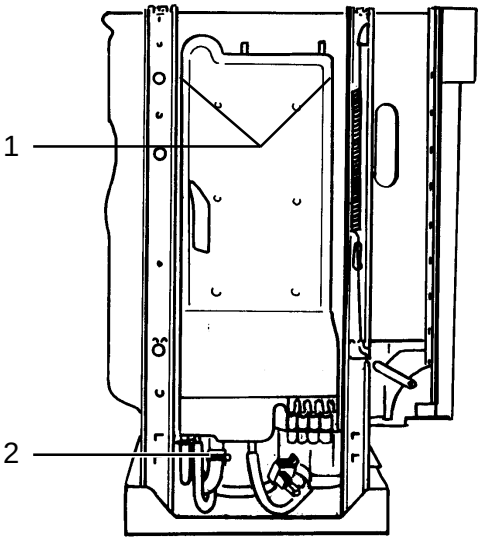


Removing the regeneration dosage chamber :

1 disengage locking tabs (1)

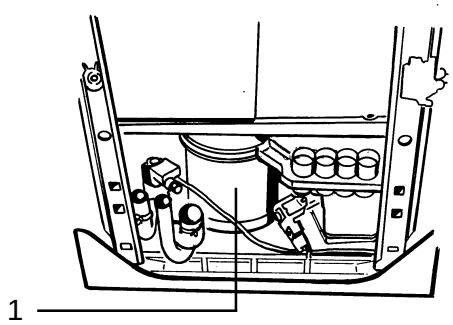
2 disconnect hoses (2)

3 holding the top of the chamber, pull upwards disengaging it from the softener.



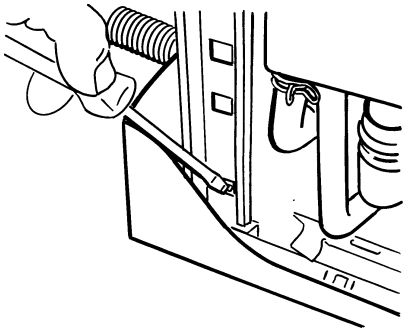
Removing the softener unit :

1 remove the securing nut located under the salt cap.
2 press softener (1) down and remove it through the front from the base area
3 CAUTION if accessible release reed switch.

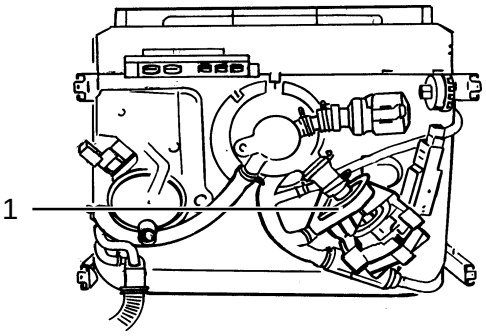


Removing the base :

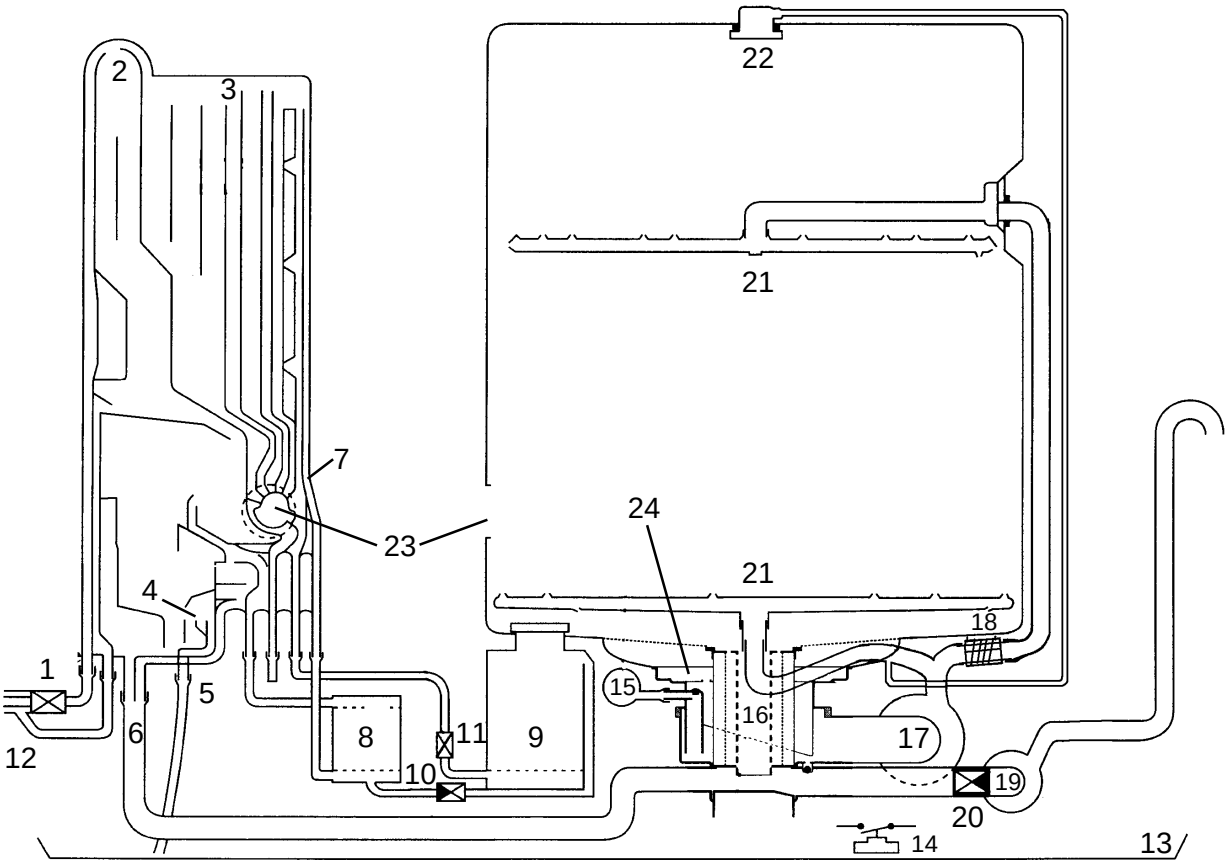
1 remove side panels, rear panel and plinth panel
2 gently release base fixing clips with a screwdriver (figure)
3 take off base carefully and release circulation pump, electronic and heater relay
4 disconnect the float switch



With base removed the circulation pump (1) is accessible.



5. Water Course Scheme



1	Inlet valve	13	Base tray
2	Air break	14	Float switch
3	Regeneration water dosage	15	Pressure switch
4	Overflow safety level	16	Filter
5	Safety overflow	17	Circulation pump
6	Inlet to sump from regeneration dosage chamber	18	Flow heater
7	Regeneration dosage chamber	19	Drain pump
8	Softener	20	Non-return valve
9	Salt container	21	Spray arms
10	Non-return valve salt container	22	Roof-mounted shower
11	Regeneration valve	23	Tub vent
12	Safety inlet hose	24	Sump assembly

6. All-Around Water Protection

Aqua-Control Inlet Hose

The inlet hose has a double-wall construction. The inner hose is equipped with a flow restrictor built into the tap connection, and has a flow rate of 4 litres per minute. The inlet valve (1) is located in the base of the dishwasher. The safety outer hose (12) is connected to the regeneration chamber. If the inner hose should burst, the water passes into the tub. The safety pressure switch activates the drain pump and decreases the waterlevel down to „normal“ level. An additional overflow protection is a defined overflow through the regeneration chamber. The water flows into the bottom tray and activates the float switch, which energises the drain pump. This drains the dishwasher preventing water damage.

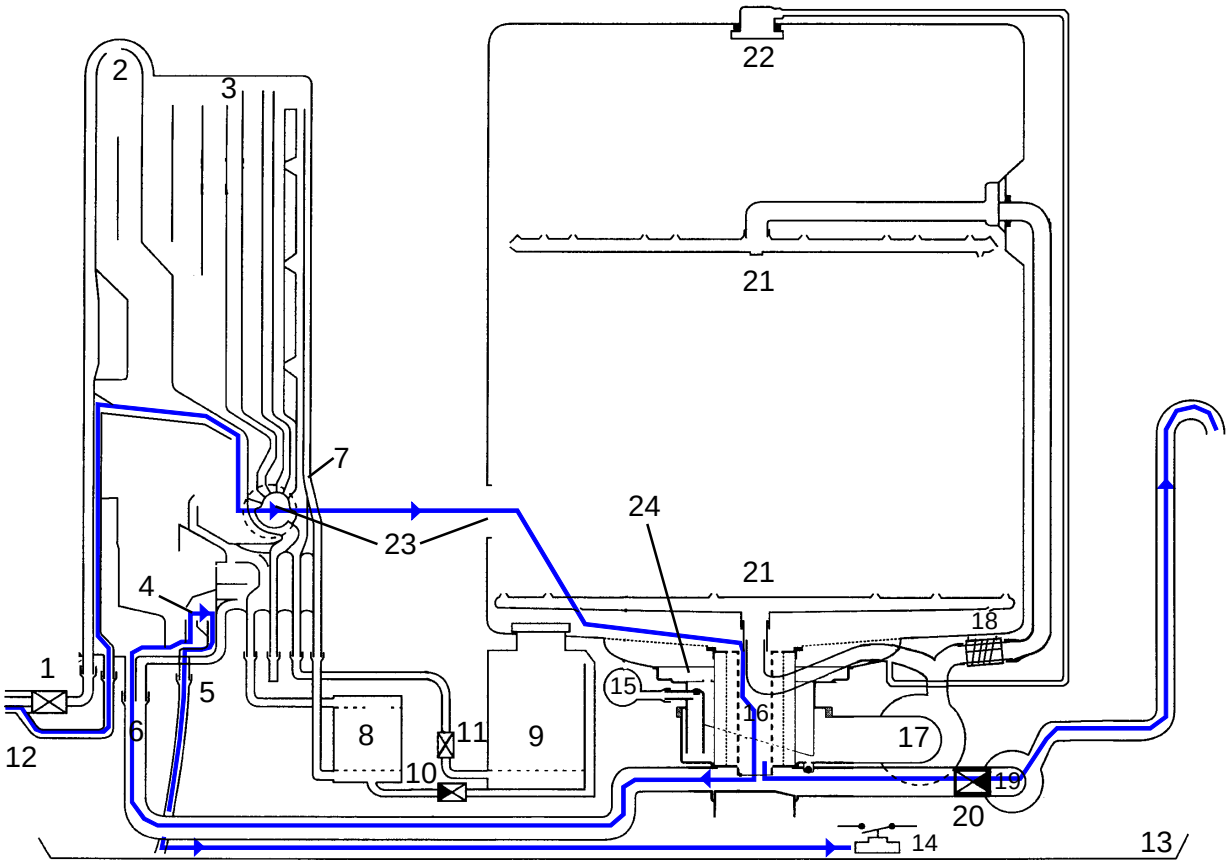
Safety level

If the safety level is reached by over-fillling, the safety pressure switch starts the drain pump. The water is only drained until it has reached the normal level because the reset point of the safety pressure switch is above the switchpoint of the normal pressure switch.

Leakage Protection

The anti-flood switch in the base tray will activate the drain pump and drain the water from the tub in the event of an internal leakage.
If the float switch is activated, all electric components are switched off except the electronic and the drain pump.

All-Around Water Protection

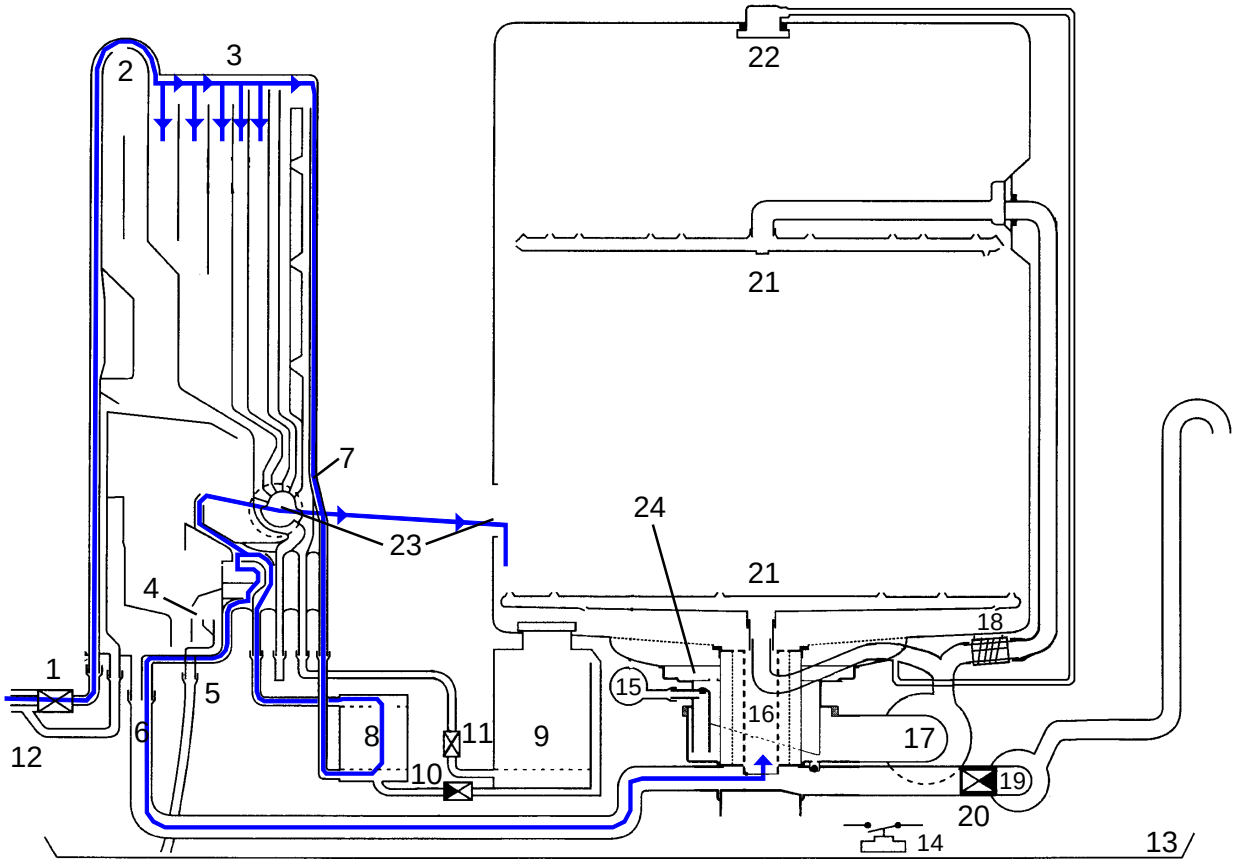


1	Inlet valve	13	Base tray
2	Air break	14	Float switch
3	Regeneration water dosage	15	Pressure switch with safety level
4	Overflow safety level	16	Filter
5	Safety overflow	17	Circulation pump
6	Inlet to sump from regeneration dosage chamber	18	Flow heater
7	Regeneration dosage chamber	19	Drain pump
8	Softener	20	Non-return valve
9	Salt container	21	Spray arms
10	Non-return valve salt container	22	Roof-mounted shower
11	Regeneration valve	23	Tub vent
12	Safety inlet hose	24	Sump assembly

7. Water Inlet

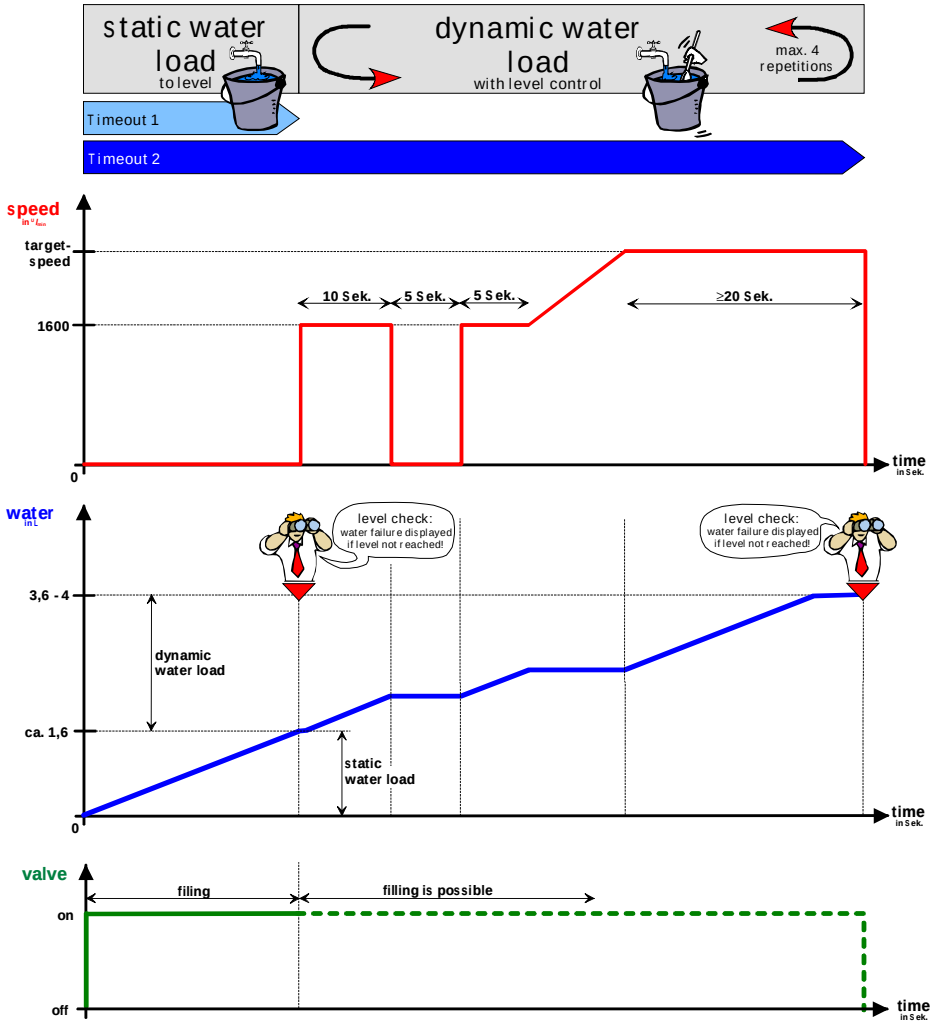
The water flows into the regeneration dosage chamber (7) via inlet valve (1), over air break (2), into regeneration dosage chambers (3) into softener (8). At this point the water divides. 1/4 of the water enters the tub through the vent (23). 3/4 of the water enters the sump (24) through hose (6).

The level control chamber built into the sump operates the pressure switch (15).



1	Inlet valve	13	Base tray
2	Air break	14	Float switch
3	Regeneration water dosage	15	Pressure switch with safety level
4	Overflow safety level	16	Filter
5	Safety overflow	17	Circulation pump
6	Inlet to sump from regeneration dosage chamber	18	Flow heater
7	Regeneration dosage chamber	19	Drain pump
8	Softener	20	Non-return valve
9	Salt container	21	Spray arms
10	Non-return valve salt container	22	Roof-mounted shower
11	Regeneration valve	23	Tub vent
12	Safety inlet hose	24	Sump assembly

8. water load steps



Static filling

- Static filling until pressure switch point.
  failure code:
  If this point isnt reached after max. 2 minutes (Timeout 1), a failure code is displayed and the program is stopped. The program phase display PPD-LED LD9 is blinking.

  ● LD9
  ○ LD10
  ○ LD11

Dynamic filling

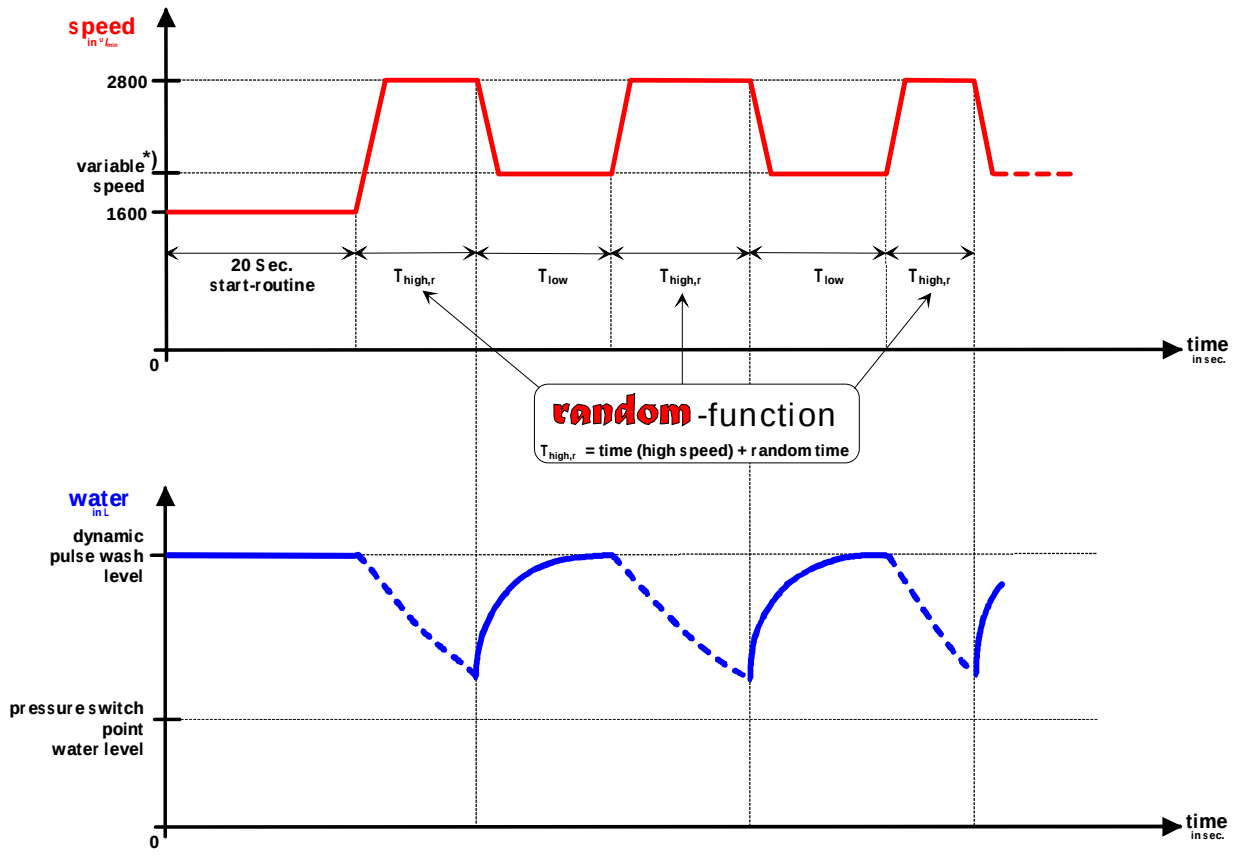
- 10 seconds filling at reduced circulation pump speed
- 5 seconds pause
- 10 seconds filling at reduced circulation pump speed
- filling with increasing circulation pump speed. As soon as the target speed has been reached, it is filled up to the pressure switchpoint.
  Failure code:
  If this dynamic switchpoint isn't reached within total 4 minutes (Timeout 2), the dynamic filling can be repeated 3 times. Only after non-successful repeating 3 times, a failure code is displayed and the program is stopped. The PPD-LED LD9 is blinking.

● LD9
○ LD10
○ LD11

*) The target speed is dependent on the subsequent pulse wash.

pulse wash	pulse 2800 1/min	Pause 1600 1/min	target speed in dynamic filling
1	0,9 sec	4,5 sec	2200 1/min
2	0,6 sec	3 sec	1900 1/min
3	0,3 sec	1,5 sec	1700 1/min

9. New pulse wash with „random“ functionality



*) The variable speed is 1600 1/min at the moment and equal to all appliances.

$$T_{high,\,r} = T_{high} + T_r$$

$$T_{low} = T_{high,\,r} + Ratio$$

Random function

$T_{high,r}$ = time for high speed (calculated with random funktion)
T_{high} = time for high speed (cycle definition)
T_r = random time
T_{low} = time for low speed
Ratio = factor for low speed (eeprom definition)

Circulation

The circulation pump (17) pumps the water simultaneously into the ceiling shower (22) and into both spray arms (21). The water is filtered in the sieves (16) and led to the circulation pump.

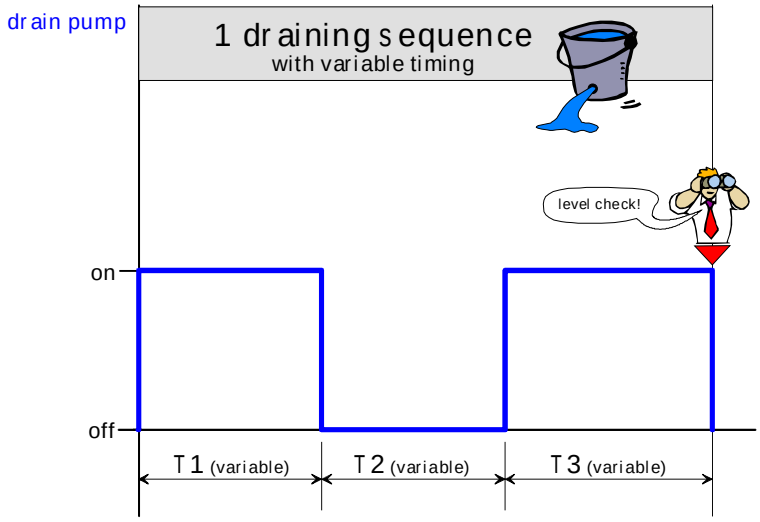
Function of the new pulse wash with "random" functionality

After the filling steps, the circulation pump is running at two rotational speeds.

Pulse Wash	Pulse time 2800 1/min		Pause 1600 1/min		Use with Wash Cycles
	Definitive Time	+ Random Time	Definitive Time	+ Random Time	
1	0.9 sec	0 - 0.3 sec	4.5	0 - 1.5 sec	prewash intensive
					wash intensive
2	0.6 sec	0 - 0.3 sec	3	0 - 1.5 sec	wash and intermediate wash
					prewash normal
3	0.3 sec	0 - 0.3 sec	1.5	0 - 1.5 sec	rinse

The ratio of pulse time and pause is always 1 : 5.

10. Sequence draining with pressure switch level check



Drain Cycle	T1	T2	T3
First draining before every wash cycle	45 sec	15 sec	20 sec
Draining after the wash cycles	30 sec	20 sec	10 sec

New draining with sequence draining

- The draining step contains of 3 time sequences.
  In the middle sequence, during time T2 the drain pump is stopped.

- At the end of the drain step, the water level is checked.

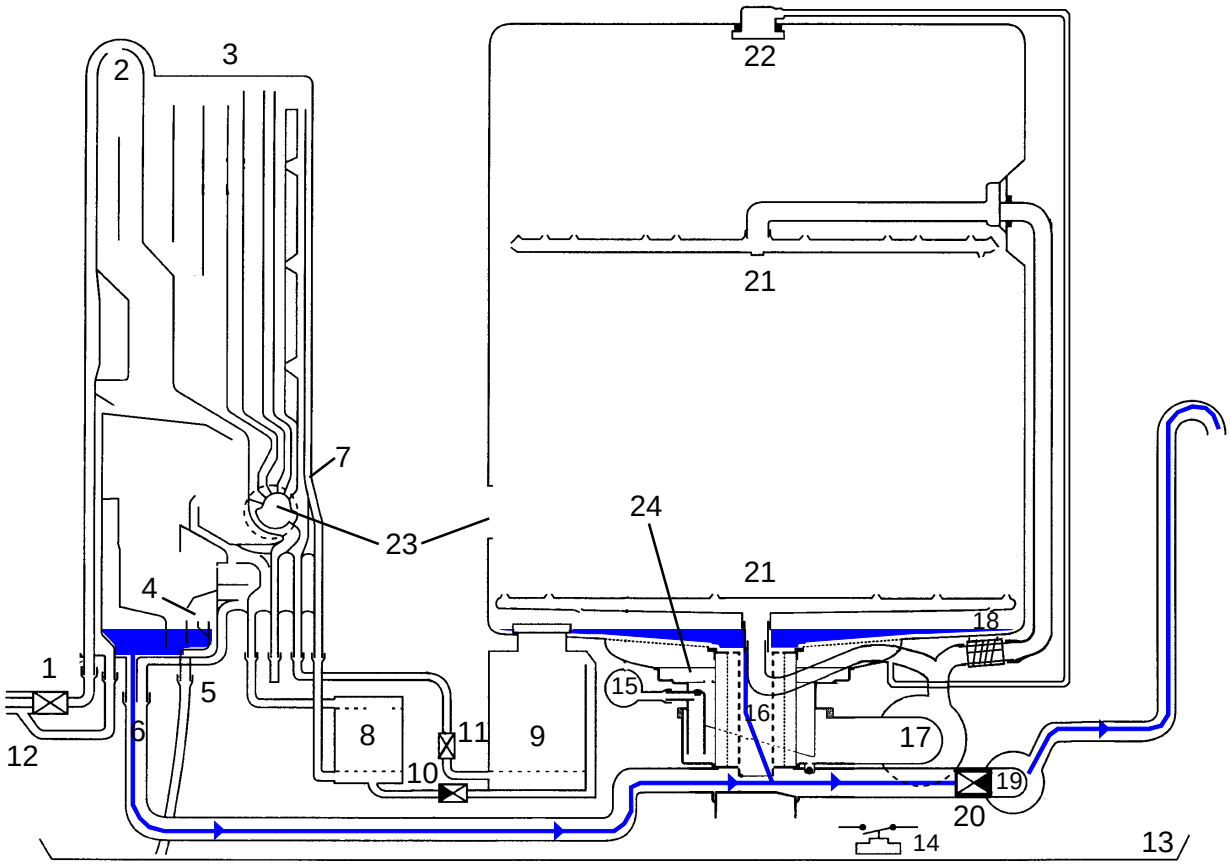
- If the switch back is reached, the drain step is terminated.
  If the switch back isn't reached, the drain step is repeated.

- A failure code is displayed, if after 2 drain steps, the switch back couldn't be reached.
  In this case, the program is stopped and PPD-LED LD10 is blinking.

  ○ LD9
  ● LD10
  ○ LD11

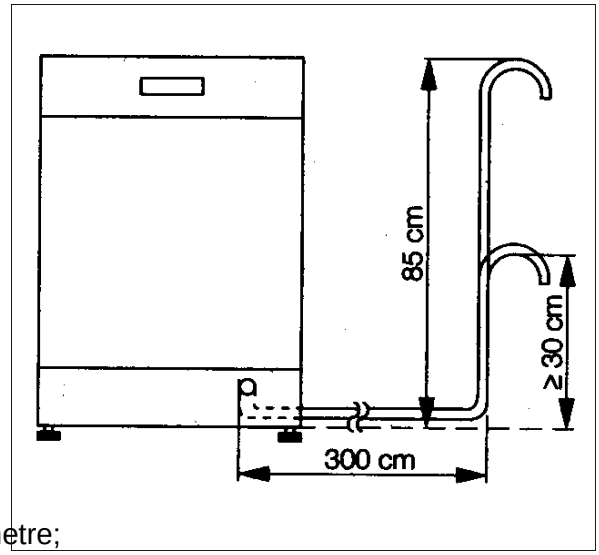
Draining

During the wash cycle the water is pumped out at various stages. First the draining water cleans the filters (16). The filters are open at the bottom which allows any soilage to be rinsed off sufficiently. There is a non-return valve (20) at the inlet connection to the drain pump (19). This valve prevents the water



1	Inlet valve	13	Base tray
2	Air break	14	Float switch
3	Regeneration water dosage	15	Pressure switch
4	Overflow safety level	16	Filter
5	Safety overflow	17	Circulation pump
6	Inlet to sump from regeneration dosage chamber	18	Flow heater
7	Regeneration dosage chamber	19	Drain pump
8	Softener	20	Non-return valve
9	Salt container	21	Spray arms
10	Non-return valve salt container	22	Roof-mounted shower
11	Regeneration valve	23	Tub vent
12	Safety inlet hose	24	Sump assembly

11. Installation of the Drain Hose



Drain hose connection:
Max. permissible height: 1 metre;
Min. height required 30 cm above floor level.
The drain hose can be extended horizontally to a maximum length of 3 metres, at a height of 85 cm.

12. Regeneration

The water chamber for regeneration (3) contains 350 ml water. During regeneration, the regeneration valve (11) is energized. The 350 ml water runs into the salt container (9) and mixes with the salt to form a brine solution.

In the top of the salt container there is an opening with a small filter, from here the brine solution passes through a non-return valve (10) and enters the softener (8) where the resins are regenerated.

The softener has 5 settings and can be adjusted to suit the degree of water hardness.

The adjustment of the water hardness is described in the short list of service functions.

Table for water hardness adjustment

Adjustment	Water hardness	number of water loads	Opening hour for regeneration valve
WH 1	4 dH	60	180 Sek.
WH 2	18 dH	16	180 Sek.
WH 3	26 dH	8	180 Sek.
WH 4	32 dH	5	180 Sek.
WH 5	50 dH	0	180 Sek.

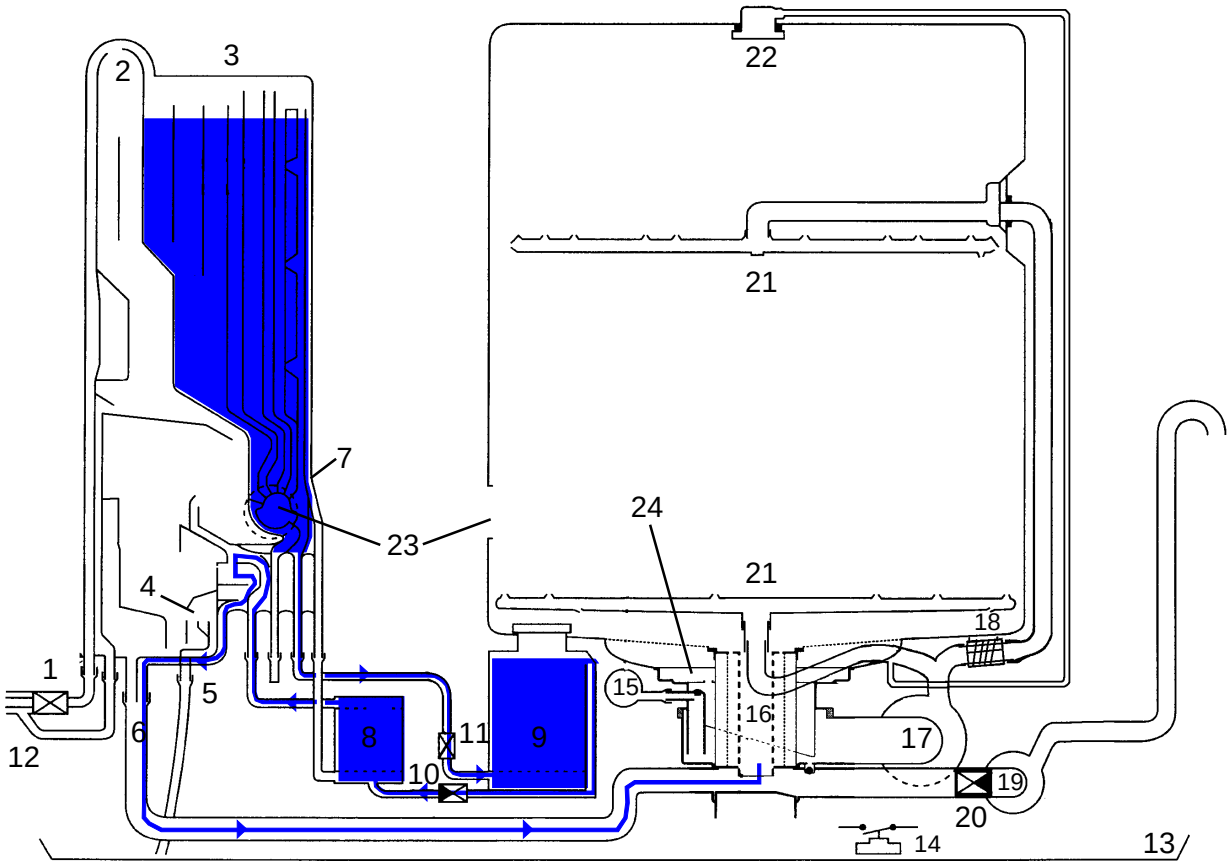
This table is stored in EEProm. Therefore the values are changeable
by variant configuration. The values on the left specify the actual status and shall only be seen as an example for this documentation.

- Column „Number water loads“ contains the value, when the regeneration will be run.
  - o With each dynamic filling step during the cycle, the counter is increased by 1. A possible refilling is not taken into consideration.
  - o If the value in the table, linked to the adjusted water hardness, is reached, the regeneration is activated. At the water hardness WH5 regeneration is done each cycle.
  - o In all DGN- and ZM45-machines, at the end of the program a 30 seconds draining of regeneration water is run.

Rinse-out after regeneration

After a regeneration at the end of the program the directly ensuing next wash cycle performs a rinse-out. This rinse-out replaces the first pumping step of the wash program.

Regeneration



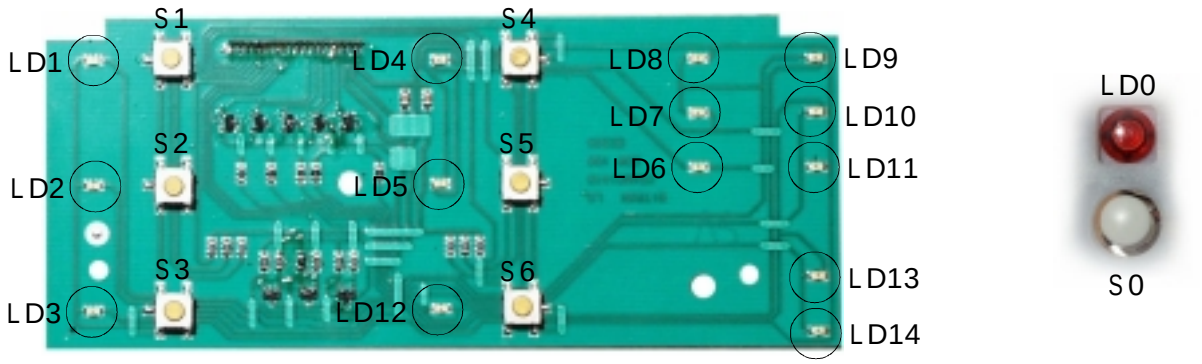
1	Inlet valve	13	Base tray
2	Air break	14	Float switch
3	Regeneration water dosage	15	Pressure switch
4	Overflow safety level	16	Filter
5	Safety overflow	17	Circulation pump
6	Inlet to sump from regeneration dosage chamber	18	Flow heater
		19	Drain pump
7	Regeneration dosage chamber	20	Non-return valve
8	Softener	21	Spray arms
9	Salt container	22	Roof-mounted shower
10	Non-return valve salt container	23	Tub vent
11	Regeneration valve	24	Sump assembly
12	Safety inlet hose		

13. In- and Output elements

Position of pushbuttons, LEDs and lamps

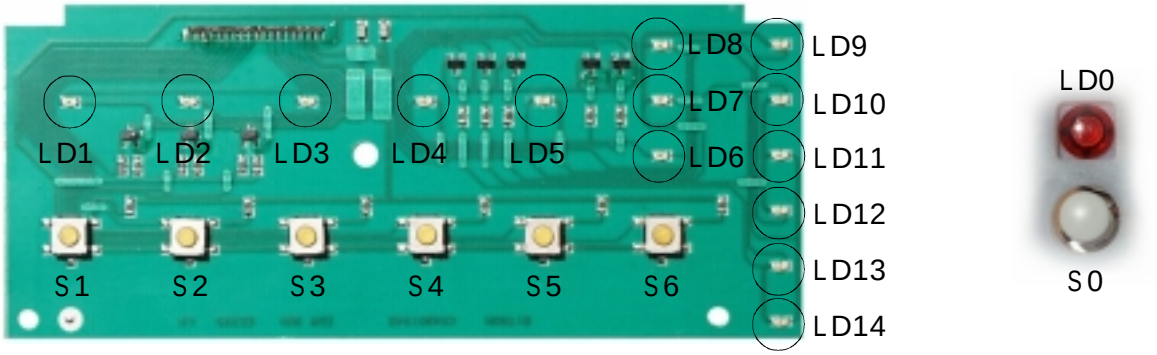
for appliances with vertical position of buttons

left side of the panel right side of the panel



for appliances with horizontal position of buttons

left side of the panel right side of the panel



14. General

Panel equipment:

- Separate On/Off switch S0
- 6 pushbuttons S1 - S6 for choice of programs and options
  All pushbutton functions can be adjusted free, without limitations, by personalisation at PNC-Level.
  The pushbuttons S1 - S3 and the LEDs LD1 - LD3 are mandatory.
  (Necessary for the control of the service functions)
- 3-step Program Phase Display (PPD) with LED's LD9 - LD11
  Actually planned indication of the LED's „Clean" - „Dry" - „End"

Optional equipment for variant handling

- 3-step start time delay (STD), displayed with the LED's LD6 - LD8
  The delay steps can be defined free, depending on the variants on PNC-level in production.
  Every start time delay must has to be between 1 and 15 hours
- LED-display for salt
- LED-display for rinse aid

Possible program options:

- Superwash
- Start time delay
- Half load „kleine Menge"
- Temperature increase and/or decrease
- Tablets program
- Additional rinse phase (Extra rinse)

Other points:

- Regeneration depending on water consumption / Adjustment and display of water hardness via user interface
- Assembly line test program
- Different after sales functions (Failure memory, Single actuator mode, LED-Test)
- Device specification for max. Energylabel ABC
- No active drying with fan possible!
- Water safety system with different variants and safety levels
  (Also depending from external components)

Type of pushbuttons:
The On/Off-pushbutton S0 is a separat power switch with toggle function
All other possible pushbuttons S1 - S6 are of push-release type and directly on the electronic board

Acknowledges and Displays:
All pushbutton acknowledges and all other displays are realised by LEDs.
The On/Off-button is the only one connected to a glow lamp instead of a LED with separat function directly indicate On/Off.

15. Input-Philosophy: Choose program- and options

Switch ON the device

- Press On/Off-button S0 to switch the machine ON.
- Display LD0 at the On/Off-button is highlighted.
  - o The machine is in Prestart-mode.
  - o All program- and option-buttons are active and can be choosen

- Now choose of **StartTimeDelay** possible
- The selection of the STD can be done with the predefined pushbutton.
  This button hasn't an acknowledge-LED.
- The activated delaytime is shown by the 3 LED's LD6 - LD8.
  Only the LED of the choosen delay time is highlighted
- The choice is a scrolling function (3h .. 6h .. 9h .. OFF .. 3h ..)
- A change or cancelling (all STD-LED's off) of the delay time is during thecwhole delay phase at any time possible.
- As there's not yet a program choosen, the selected STD value remains unchanged till a valid program is choosen and the LEDs are blinking.

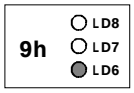
Programs / Options selection

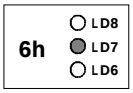
- The user selects a program by pressing the defined pushbutton.
- The LED of the choosen program is highlighted as a acknowledge.
- Within 6 seconds, the user can change the program or choose one or more possible options.
- During this phase PPD-LEDs LD9, LD10 or - LD11 are blinking
- Activation from options or StartTimeDelay (STD) is only possible before programm start!

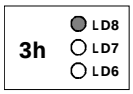
- **Select options** possible
- Press related option button.
- Only predefined, permissible combinations are accepted.
- If the selected option is accepted, the LEDs of program and option button are highlighted.
- Within 6 seconds additional options are selectable

- **Select StartTimeDelay** possible
- The selection of the STD is done with the related pushbutton.
- The activated delaytime is shown by the 3 LED's LD6 - LD8.
  Only the LED of the choosen delay time is highlighted
- The choice is a scrolling function (3h .. 6h .. 9h .. OFF .. 3h ..)
- 6 seconds after pressing the last pushbutton, the timer for the delay time is started.
- Within this 6 seconds besides LEDs for the selected program is highlighted.
- Besides this, PPD-LEDs LD9, LD10 or LD11 are blinking.
  During this phase PPD-LEDs LD9, LD10 or - LD11 are blinking
- During the run of the delay timer, the program- and delaytime LEDs are highlighted, the PPD-LEDs are switched off.
- A change or cancelling (all STD-LED's off) of the delay time is during the whole delay phase at any time possible.

- Countdown of **StartTime**
- The StartTime is counted backwards, beginning with the adjusted value until 0h. Afterwards the program starts automatically. (see description on page B 4 / subject „Programstart“)
- The display is updated accordingly.
- Display of StartTime:
  9h to 6h
  6h to 3h
  3h to 0h
  0h / Start
  (Other values possible, due to variant programming!)







- Each activation of a pushbutton with in the 6 seconds of the program selection time, resets the timer for the program start (where the pushbuttons are deactivated) again back to 6 seconds.

16. Input-Philosophy: Programstart till -end

Program start

- After the end of the selected StartTimeDelay time or 6 seconds after the last program- or optionbutton activation, the choosen program is automatically started.
- From this time on, a delay time or program option can no longer be choosen.
  To select a delay time, a restart of the machine is necessary.

Program run

- During the program run, the following LED displays are highlighted:
  - o Pushbutton-LED of the choosen program and options
  - o Depending on the program phase, the related PPD-LED LD9 - LD11
- The program cycle is described separetely in chapter „Program cycles“.

Program end

- The End of program is displayed by PPD-LED „End“
- The acknowledge LED of the program and, if choosen, of the option button(s) remain ON.
- After reaching the program end, the actual program can be deleted by
  either opening the door or switching OFF the machine by the ON/OFF button S0.
- If the program was deleted by opening the door, the maschine is automatically in pre-start mode, if the door is closed again, this means, that immediately a new program could be choosen.

17. Input-Philosphy - delete, change, abort

Delete program

- A selected and started program can be deleted at any time.
- Therefore the pushbutton of the selected program has to be pressed as long (3 Sek.) until the related LED is switched off.
  - o During this time, the program and possible option LEDs are blinking.
- The program is aborted and deleted.
  - o Besides this the LEDs of all program and option-buttons and the PPD-LED's LD09 - LD11 are switched off.
  - o Only the Power-lamp LD0 at the On/Off-switch remains highlighted.
- The machine is again in „Prestart"-mode.

Change program (after program start)

- A change of the program during a running cycle can only be realised by using the function „Delete program" ! (see above)

Program interrupt / Pause-Function

- With the help of the ON/OFF button S0 the program can be interrupted as long as one likes. This is equal to a „Pause"-function. The same is valid for an interrupt by opening the door.
- There is no delete function integrated in the ON/OFF button S0!
- If the program is interrupted by the ON/OFF button, all displays are switched OFF.
- The program cycle is continued immediately after switching the machine ON again with the ON/OFF-switch, respectively after closing the door. No additional button activation necessary. Special remark for steps with activate circulation pump:
  The cycle continues with a reduced speed off the circulation pump for about 20 seconds.
- All displays and acknowledges are shown in the same status as before the interrupt.

What happens on Opening and Closing the door?
(see description „Power fail")

- Device is switched on and timer is in „Prestart"-mode
  - o After opening the door, all displays on the user interface remain as they are.
    The power supply of the timer is guaranteed, as long as the device remains switched ON by the On/Off-switch S0.
- The door is opened during program run
  - o By opening the door, the program can be interrupted for any time without loosing information.
    This is equal to a „Pause" function.
  - o After opening the door all displays remain ON, except the PPD-LED's LD09 bis LD11, as long as the device isn't switched OFF by the ON/OFF switch S0.
    The actual PPD-LED's are blinking, as long as the door remains open.
  - o After closing the door, the cycle continues immediately.
- The door is opend after reaching the end of the program
  - o If the program end is reached and the door opend, the device is again in „Prestart"-mode.

18. Program phase display, Status display

Program Phase Display PPD

- PPD has always 3 steps
- The PPD is realised by 3 LED's (LD09 - LD11)
- The program phases are actually defined: „Clean" - „Dry" - „End"
- The displayed phases are related to the program cycle.
- During the program selection, but before the real program start all relevant program phases are shown in parallel by blinking LEDs.
- E.g. in the Quick program or in the Prewash program, only PPD-LED LD09 is blinking, in all other programs, LED's LD09 and LD10.
- After program start, only the LED for the actual program phase is ON.
- The switch from one program phase to the following in done at the step change.
- The display „End" (PPD-LED LD11) is not shown before the real program end, when the timer has reached the end status.
- With the PPD-LED's LD09 - LD11 also different failures are displayed.

Status resp. Indication displays:

- Displays are available depending on the device variant.
- The display is done mainly by theLEDs LD13 and LD14.
  If necessary due to design reasons, also other positions for the display are possible.
- The display is realised by a permanent activation of the relevant LED.
- The LEDs are ON beginning with the machine switched ON by the ON/OFF switch S0, till the start of the program, this means, also during a possible StartTimeDelay phase.
  Besides this, also from program end (PPD-LED End) till switching OFF the device.
- The display LEDs are switched OFF during the complete program cycle!
- **LED-display SALT**
  - o „ON" if salt level is low
  - o Switched off, after adding salt.
    (Due to salt dissolution it can take some hours for switch OFF)
    Comment LED-Display Salt is switched OFF if waterhardness „WH1" is adjusted.
    (no regeneration necessary)
- **LED-display RINSE AID**
  - o „ON" if rinse aid level is low
  - o Switched off, after adding rinse aid.

19. Adjust water hardness:

General information

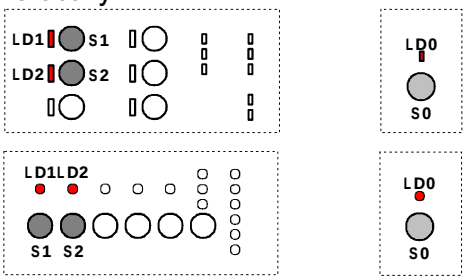
- The adjustment and change of the water hardness area is valid for all designs and button configurations.
- For this function, always the buttons S0, S1 and S2 are relevant, independent of their varying program functionality given by variant programming.

General:

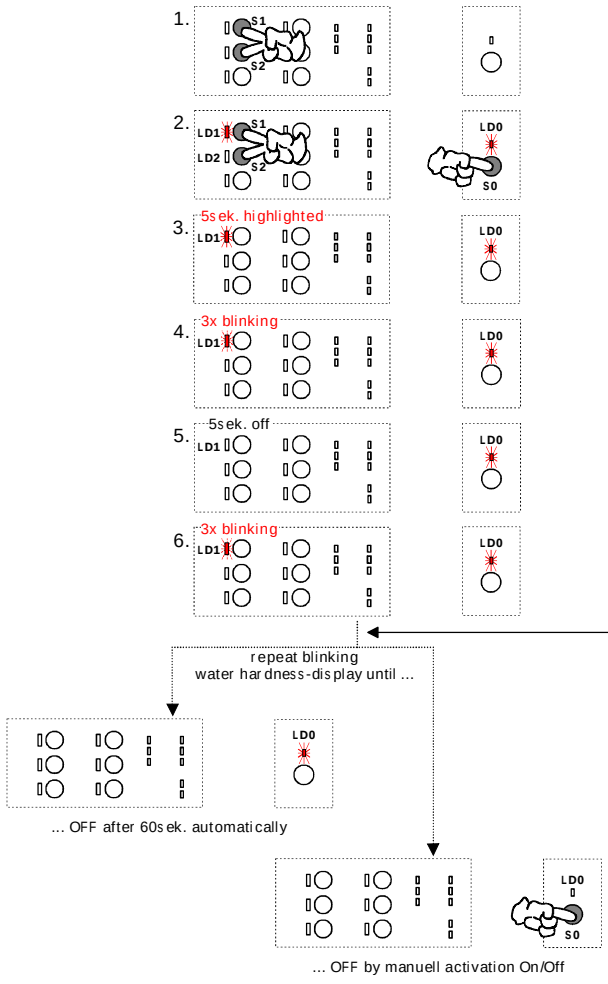
- In production line, the pre-adjustment is WH3.
- On „WH1“ no regeneration is carried out. No salt is necessary. A possible Salt-LED will not be activated.
- Table for hardness areas:

adjustment	water hardness	Show with LED LD1
WH 5	41 - 50 dH	5x blinking
WH 4	30 - 40 dH	4x blinking
WH 3	19 - 29 dH	3x blinking
WH 2	4 - 18 dH	2x blinking
WH 1	under 4 dH	1x blinking

Button configurations vertically



Button configurations horizontally



Call / Change / Store the value for water hardness

Call function „Water hardness adjustment“

1. Press at the same time button S1 and S2 and ...

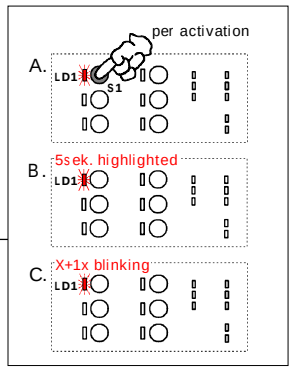
2. ... Keep them pressed, as long as the device is switched ON by S0. For acknowledge the LED LD1 ... Is switched ON ...

3. ... for about 5 seconds.

4. The actual value of water hardness is shown by the blinking of LED LD1.
(In the example on the left, by 3 times blinking, the pre-adjustment as done in production is shown.)

5. / 6. Then the LED is switched OFF for 5 seconds ...
After that, this procedure is repeated continuously up to 60 seconds.

(3x blinking – 5sec. Pause – 3x blinking – 5sec. Pause – aso.).



Change of adjusted water hardness

A By pressing button S1 the value is changed.
The valus is increased scrolling.

B For acknowledge the LED LD1 is switched ON for approx. 5 seconds

C The new value is then shown by the coded blinking of LED LD1.

Each additional button S1 activation increases the value scrolling.
(WH1 - WH5)

Store adjusted water hardness
The updated value is stored immediately after each successful input.

Terminate this function
Automatically 60 sec, after the last activation of button S1 or by switching the device OFF by the ON/OFF button S0 this special program is terminated.

20. Service-functions for assembly line

Assembly line test program:

- Press program buttons S1 and S3 simultaneous and keep them pressed until the device is switched ON by the ON/OFF switch S0.
- For acknowledge, that the function „assembly line test program“ is active, LED LD3 is blinking.
  This LED keeps on blinking during the whole program cycle.
- The program starts automatically after 3 sec.
- This specific assembly line program simulats a normal wash cycle and run analogus.
- The program phase is displayed by PPD-LEDs LD9 to LD11
- At least 3 seconds after power failure the full function is restarted.
- The test program can be interrupted by opening the door.
- During „door open“,the program LED LD3 is blinking and the related PPD-LED is ON.
- The test program can only be terminated by an additional activation of button S3.
  (See also description „Delete program“)
- At the end of the test program, the LED LD3 is blinking and the PPD-LED „End“ is ON.
- In the assembly test program, the regeneration is run in any case, not only depending on water consumption.

Adjust and recognise heating power:
- The heating power is considered in the machine personalisation.
- All machines equiped with EDW1000 will be build up with 10A heating element.

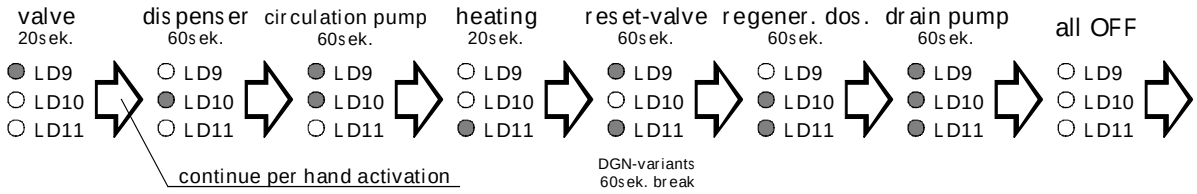
The assembly line test program takes approximately 16 minutes and proceeds as follows:

Program Run Display	Step	Function	Time
LED 9	1	static filling	up to level
	2	dynamic filling	10 sec
	3	pause	5 sec
	4	dynamic filling	up to level + circulation pump with increasing speed up to 1900 1/min
	5	circulation pulse 2	
		heating	up to 50 °C
		detergent dispenser	30 sec
LED 10	6	draining	30 sec
	7	pause	20 sec
	8	draining	10 sec
	9	regeneration	120 sec
	10	drain	30 sec
LED 11	11	End	

21. Customer service functions

Single actor activation

- Press program button S2 and S3 simultaneous and keep them pressed until switching the machine on with the ON/OFF button S0 .
- For acknowledge, that the function is active, the LEDs LD1, LD2 and LD3 are blinking.
- By pressing the program button S2 the function is started.
- During the whole cycle, LED LD2 is blinking.
- The first component to be activated automatically is the inlet valve. All additional actors can be started in the below mentioned sequence, by pressing button S2 repeatedly.
- Each of the single actors is switched ON for the below given time. Afterwards, he's automatically switched OFF. In the following, the machine remains in a PAUSE mode, until the next actor is started by pressing button S2 or until the function is terminated.
- The actual component is displayed by a code of the PPD-LEDs.
- The sequence of activation is fixed and scrolling. It can't be changed.
- The time of activation can be shorted by pressing button S2 already before the timeout of below given value.
- Sequence of activation, ON-time and PPD code:



- The function remains active until terminated by pressing the ON/OFF-button S0 .

Indication of customer service failure stack

- Press program button S2 and S3 simultaneous and keep them pressed until switching the machine on with the ON/OFF button S0 .
- For acknowledge, that the function is active, the LEDs LD1, LD2 and LD3 are blinking.
- By pressing the program button S1 the function is started.
- During the whole cycle, LED LD1 is blinking.
- The failure code is displayed by PPD-LEDs LD9 to LD11.
  (see chapter „Overview of failure displays)
- The failures can be displayed scrolling, by repeatedly pressing button S1 .
- In maximum, the last 3 occured failures can be shown.
- The function can only be terminated by switching the machine OFF with the ON/OFF button S0 .

Delete the customer service failure stack and LED-test

- Press program button S2 and S3 simultaneous and keep them pressed until switching the machine on with the ON/OFF button S0 .
- For acknowledge, that the function is active, the LEDs LD1, LD2 and LD3 are blinking.
- By pressing the program button S3 the function is started.
  !! Attention: By starting the function, the failure memory is cleared automatically !!
- All LEDs on the panel (max. LD1 to LD14) are switched ON simultaneous for approx. 1 second.
  The activation of the LEDs is repeated twice, with a pause of 2 sec inbetween.
  Afterwards the function is terminated.
- The function can only be terminated before, by switching the machine OFF with the ON/OFF button S0 .

22. Misuse and program interrupt

Parallel activation of 2 or more buttons

- In terms of electronic control an exactly parallel activation of 2 or more buttons is not possible in the practical use.

Button pressed too long (with already running program)

- If a program button is pressed for more than 3 seconds, this can cause the running program to be deleted or changed.
  (see description „Delete program, change program“)
- If an option button is activated, this causes no influence on the program run.
  These buttons are deactivated after program start.

Failure during program run

- The failure is displayed by a blinking program LED and the blinking PPD-LEDs according to the defined code (see table). LEDs of probably choosen options remain ON.

Removeable failure - „Water tap closed“, „Drain pump blocked“

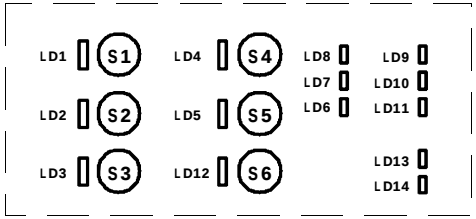
- If the recognised failure is removeable by the user the machine automatically changes in a PAUSE mode.
- As soon as the failure, e.g. „water tap closed“ is recognised, the program is stopped in the actual step.
- The control is waiting until the failure was removed (if possible).
- To continue the program, the ON/OFF button S0 has to be switched OFF and ON.
- The program cycle continues from the actual program step. No program information is lost.
- It’s not necessary to delete the program.

Other failures

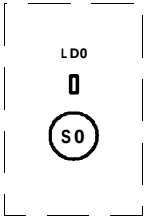
- All additional failures, which are partly also visible for the customer by the PPD-LEDs, are listed in the table on page B12 in more detail.

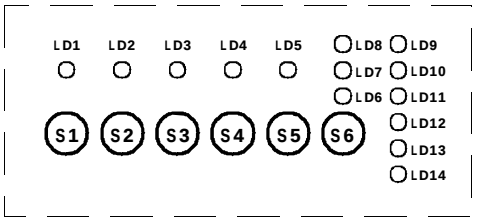
Power fail

- If a power fail occures, the machine shows the same behaviour as if switched OFF with the ON/OFF button.
- On power return, the machine shows the same behaviour as if switched ON with the ON/OFF button.
- The program continues from the last valid step. No program information is lost.
- The program continues after power fail without additional button activation.

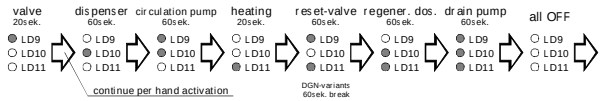


Vertical position of buttons





Horizontal position of buttons

Function	Activation of base function			Choose resp. Start of function			Short-description / Comment
	with button(s)		LED - display	with button(s)		LED - display	
Choose water hardness	S1 + S2 then afterwards S0 (On/Off)	→	LD1 highlighted 5sek. Afterwards display of actual adjusted hardness by blinking	S1	→	LD1 highlighted 5sek. Afterwards display of new adjusted hardness by blinking Code	(chapter "Adjust water hardness")
Assembly line test program	S1 + S3 then afterwards S0 (On/Off)	→	LD3 blinking	Start after 3 Sek. Automatically	→	LD3 blinking	The assembly line test program works automatically. ("Assembly line test program")
Activation of single actuators	S2 + S3 then afterwards S0 (On/Off)	→	LD1 + LD2 + LD3 blinking	S2	→	LD2 blinking	 (chapter "Single actor aktivation")
Display Service failure memory	S2 + S3 then afterwards S0 (On/Off)	→	LD1 + LD2 + LD3 blinking	S1	→	LD1 blinking	The failure is displayed coded by the PPD-LEDs. The stored failures can be scrolled through, by pressing button S1 . (see description "Indication of customer service failure stack" and "Overview of failure displays)
Delete Service failure memory Display test	S2 + S3 then afterwards S0 (On/Off)	→	LD1 + LD2 + LD3 blinking	S3	→	3 times short activation of all available LEDs with 2 sec Pause inbetween	The customer service failure stack was delete (chapter "Delete the customer ...")
Stop the function	**All service and after sales functions can only be stopped by switching the machine of with the On/Off switch S0.** Except: Water hardness adjust - Function is also terminated by a 60sec timeout after the last activation of button S1. Clear failure mem						

Failure	Display PPD - LED's	Failure display visible for customer	Visible in failure memory (After sales)	Short description	What happens?
Closed water tap	● LD9 ○ LD10 ○ LD11	yes blinking	yes highlighted	Timeout for filling - Failure recognised if ... 1) ... after 2 min of static filling ... 2) ... after 4 min of total filling ... 3) ... after 1 min of dynamic refilling during heating phase ... ... the switch point of the pressure switch wasnt reached.	Progr.-LED blinking. Program stopped. After removing the failure, the program can be continued bei pressing button S0 (OFF-ON).
Drain pump	○ LD9 ● LD10 ○ LD11	yes blinking	yes highlighted	Pressure switch didn't reach the switch back after 2 drain cycles.	Progr.-LED blinking. Program stopped. After removing the failure, the program can be continued bei pressing button S0 (OFF-ON).
Aqua-Control	● LD9 ● LD10 ○ LD11	yes blinking	yes highlighted	Floating switch detects water in the bottom tray (Debounce time 2sec.)	Program interrupted. Inlet valve closed and drain pump activated for 1 drain cycle (approx. 1min). After removing the failure, the program can be continued bei pressing button S0 (OFF-ON).
Heating	○ LD9 ○ LD10 ● LD11	no	yes highlighted	Target temperature not reached after a timeout of 45 min. (Only possible in temperature controlled heating steps)	Program is terminated without activation of the heating element! All heating steps last 45min in general.
NTC-Sensor	● LD9 ○ LD10 ● LD11	no	yes highlighted	NTC short circuit or interrupt. The NTC is controlled between the 1st filling and the start of the drying cycle	Program is terminated without activation of the heating element! All heating steps last 45min in general.
Tacho	○ LD9 ● LD10 ● LD11	yes blinking	yes highlighted	After activating the circulation pump, within 30 sec no signal from the tachometer is recognised.	The program is interrupted. By pressing the button S0 (OFF-ON), the program can be restarted. (Failure repeatedly occuring ⇨ Service call)
Circulation pump Triac short circuit	● LD9 ● LD10 ● LD11	yes blinking	yes highlighted	Signal from tachometer is recognised, although the circulation pump isn't activated.	The program is interrupted and water filled till the switch oint of the pressure switch. By pressing the button S0 (OFF-ON), the program can be restarted. (Failure repeatedly occuring ð Service call)
Wrong variant programming	no display	no	no not possible	Checksum in EEProm not correct. Only recognised after switching ON.	No program selection possible On/Off-lamp (LD0) on

25. Programms and Options

Programs	half load	rinse +	Superwash	reduce / increase temperature	tablet program
Flexible program_1	☺	☺	☺	☺	☺
Flexible program_2	☺	☺	☺	☺	☺
Intensiv 70°	☺	☺	☺	☺	☺
Intensiv 65°	☺	☺	☺	☺	☺
Normal 65°	☺	☺	☺	☺	☺
Normal Bio 50/55°	☺	☺	☺	☺	☺
Energysaving	☺	---	---	---	☺
ECO 65°	---	☺	☺	☺	☺
ECO BIO 50/55°	---	☺	☺	☺	☺
Eat load Run	☺	---	---	---	---
Quick 50°	☺	---	---	---	---
Quick 40°	☺	---	---	---	---
Pre wash	---	---	---	---	---
Line program	---	---	---	---	---

26. Description of the options

Option .... half load

- Chooseable to all programs, except „Prewash“
- If the choosen program has a phase „prewash“, this phase is skipped.
- The speed of the circulation pump is reduced in the filling step.
- Reduction of average time are 28 minutes by intensiv programmes, 18 minutes by programmes. The water consumption is reduced about 5 liters.

Option .... rinse +

- Chooseable to all programs, except „Prewash“, „Quick“-, „Glass“-program and „Energysaving“
- An additional prewash phase is added to the program cycle.

Option .... superwash

- Chooseable to all programs, except „Prewash“, „Quick“-, „Glass“-program and „Energysaving“
- Changes in the prewash phase (not available in Eco 65° and Eco Bio 50°)
  - o hot prewash with higher temperature. Temperature is increased from 40°C to 55°C.
  - o Two soaking phases of 5 minutes duration are added to the cycle. Inbetween these phases the circulation pump is activated for a short time. In this soaking phases, the soil is softened and comes off.
  - o Additional prewash time of total 7 minutes is added. During this time the temperature is kept on 55°C by enableing re-heating.
  - o The duration of the program phase „prewash“ is increased with this option by 18-20 minutes
- Changes in the cleaning phase.
  - o Additional 6 minutes of cleaning, with heating to max. 55°C
  - o Additional 20 minutes cleaning with a controlled temperature of 70°C (resp. 65°).
  - o The duration of the program phase „cleaning“ is increased with this option by approx. 26 minutes.
- This option doesn’t influence the program cycle in the phases „hot rinse“ and „drying“. In the program „Normal 65°C“ an additional 2nd intermediate rinse is run, as already available in the Intensive program.

Option .... reduce / increase temperature

- Chooseable to all programs, except „Prewash“, „Quick“-, „Glass“-program and „Energysaving
- Important!
  Per device, it is only possible either to increase or to decrease the temperature by an option button. This has to be carefully watched when building variants!
- This option exclusively influences the temperatures in Prewash and Cleaning.
  The temperature in Hot Rinse remains unchanged.
- The value for temperature in- or decrease is stored in EEProm and therefore changeable for different variants.

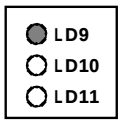
Option .... tablet program

- Chooseable to all programs, except „Prewash“, „Quick“- and „Glass“-program
- To better dissolve the tabs, and additional temperature step of 40°C is added in the cleaning phase.
- Due to this, the time of this phase is increased by approx. 5 minutes.

27. Rinse, resin wash, regeneration and measure

rinse

- Always when activating the circulation pump and/or the interheater, refilling of water is enabled.
  - o But the maximum refill time is limited to 60 seconds.
  - o Exceeding this limit causes a failure code display and the program cycle is stopped.
    PPD-LED LD9 is blinking.



measure to cleaner and rinse aid

- The activation times of the dispenser were optimised with the EDW1000:
  - o In program phase „cleaning“
    30 seconds ON
  - o In program phase „hot rinse“
    30 seconds ON / 30 seconds OFF / 30 seconds ON
    The dosage of rinse aid is temperature controlled at a minimum of 50°C.